

Core Manufacturing

Process Manufacturing Cockpit MANTHEY

Sheet Change
 Process Order: 000070000910 Material Number: MX_DULK_01 Batch: 0000000097

Components to be weighed

Plant	Material	Description	Quantity	Unit	Target Qty.	Weighed Qty.
0100	MX_RAW_AI_01	Active Ingredient 01	0.100	kg	0.100	0.100 (100.0%)
0100	MX_RAW_CM_01	Compensation Material 01	0.000	kg	0.000	0.000
0100	MX_RAW_01	Raw 01	1.000	kg	1.000	0.996
0100	MX_RAW_02	Raw 02	6.000	kg	6.000	6.000

Room Readiness

Room: J.A.A.J.U.0

Test Date, Materials & Dishes: Status: Fig. gone, release, from production

Warnings of 000-RAW-01

Jump to activate

Weigh **0.100 KG** ($\pm 1.0\%$) of component **MX_RAW_AI_01 (Active Ingredient 01)**.

Scale: J.A.A.J.U.0
 Status: Fig. gone, release, from production
 Target Wt: J.A.A.J.U.0
 Status: Fig. gone, release, from production

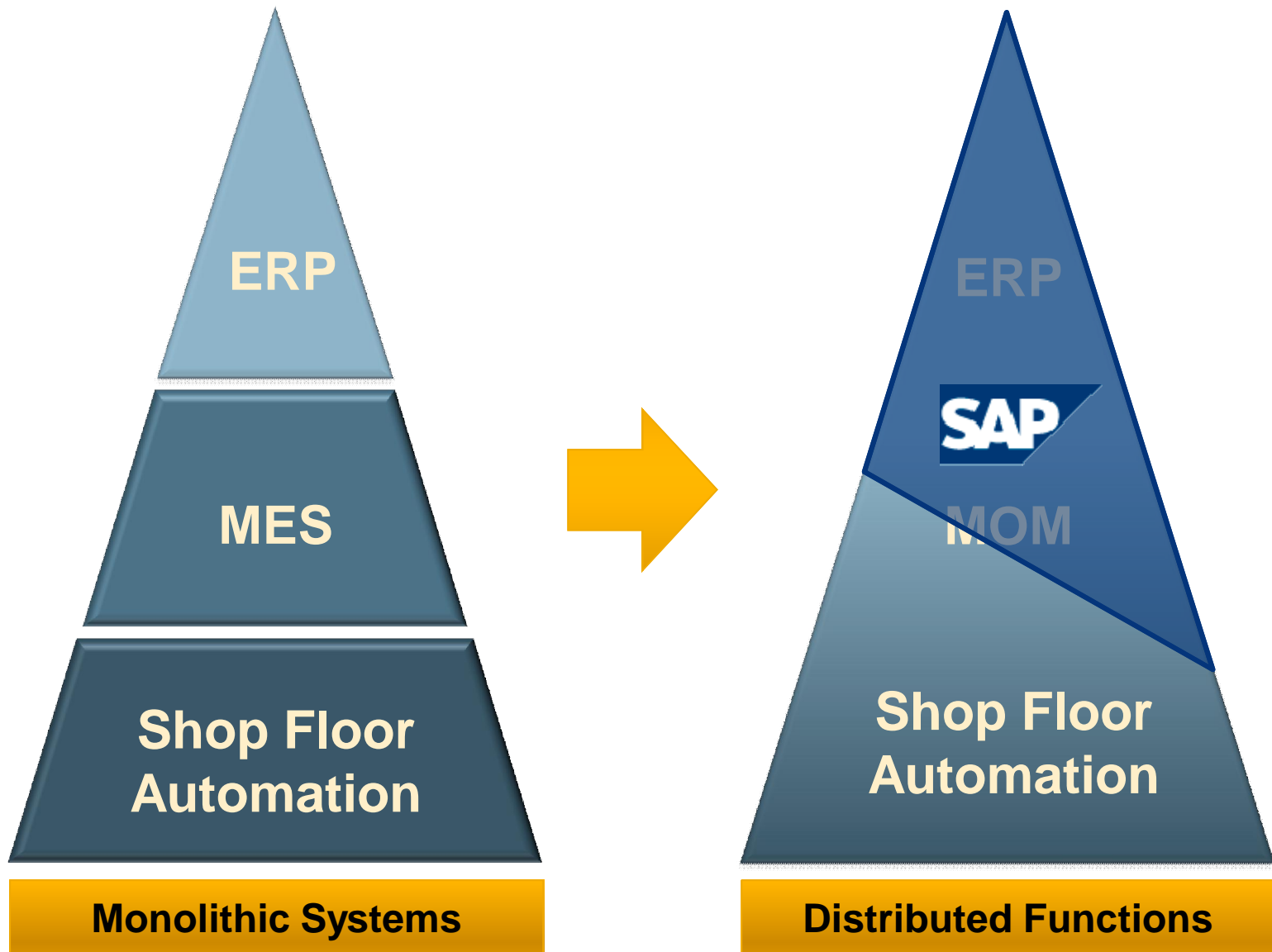
Warning Icon:

Weighing Logs

Doc	Action	Date	Time	User	Room	Scale	Wt.	Batch	Target Qty.	Zero	Low Weight	Unit Weight	
OK		17.09.2007	18:10:05	MANTHEY	0000-981	0000-888	0000-404	0000	(100.0%)	290.00 g	Y	1.00 g	100.00 g
OK		17.09.2007	18:10:40	MANTHEY	0000-981	0000-888	0000-404	0000	(0.0%)	47.00 g	-	-	40.00 g
OK		17.09.2007	18:11:19	MANTHEY	0000-981	0000-888	0000-404	0000	(100.0%)	29.00 g	-	-	29.00 g

Document: 0000-0000000009907 was started successfully

Arne Manthey
 SAP AG
 06/2010



SAP ERP Touchpoint Processes with Manufacturing



Warehouse Mgmt.

- Production Supply
- Transportation Orders

Plant Maintenance

- Equipment Qualification
- Maintenance Orders
- Time Tickets
- Component - Consumption
- Work Assignment
- Tools

Production Planning

- Production Orders / Process Orders (S88)
- Operations / Phases
- Time Tickets
- Material Consumptions
- PI Sheet / Electronic Work Instructions

ERP

FI

CO

HR

WM

MM

PM

QM

APO
PP/DS

PP/
PP-PI

Human Resources

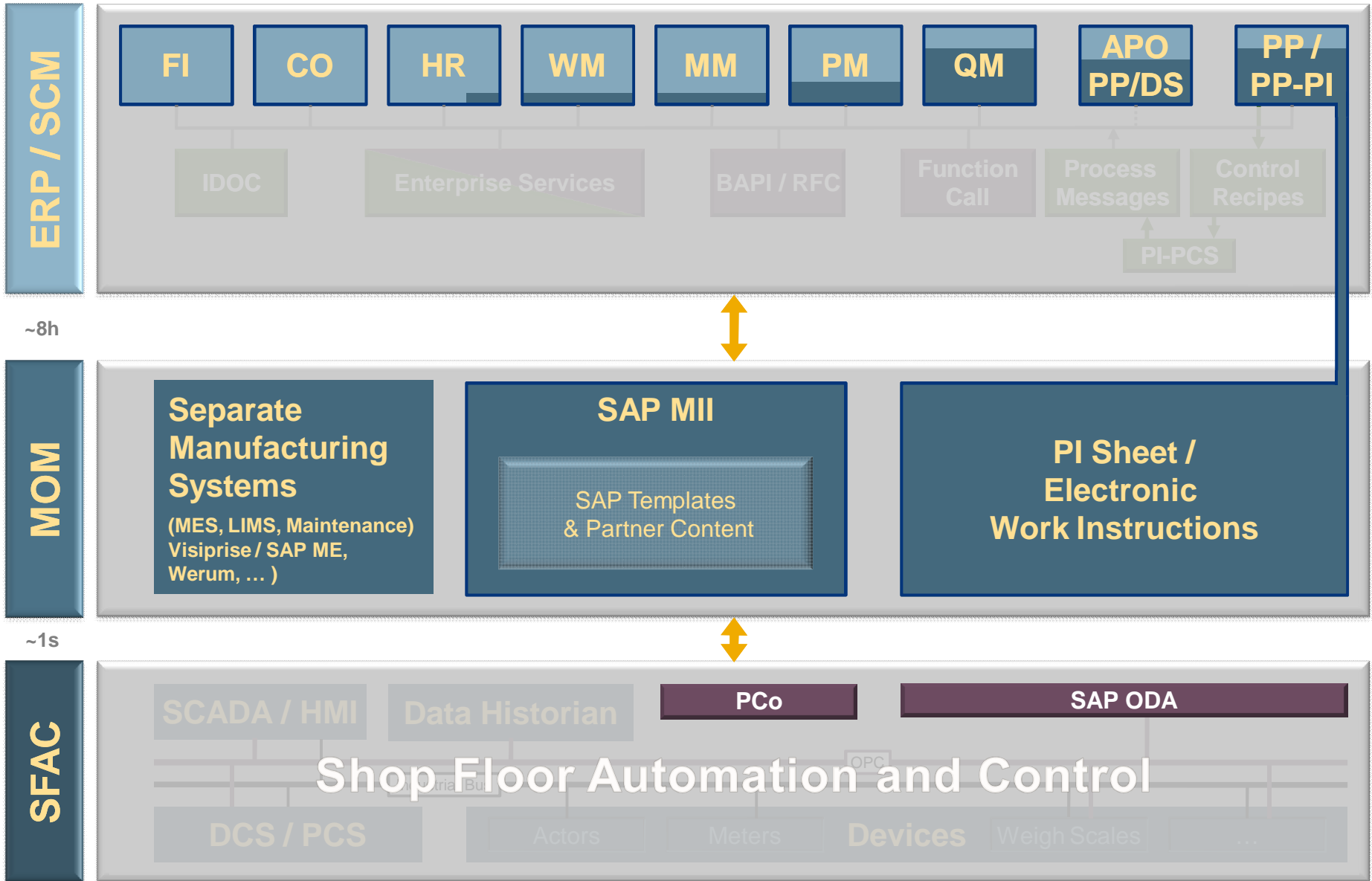
- Qualification Records

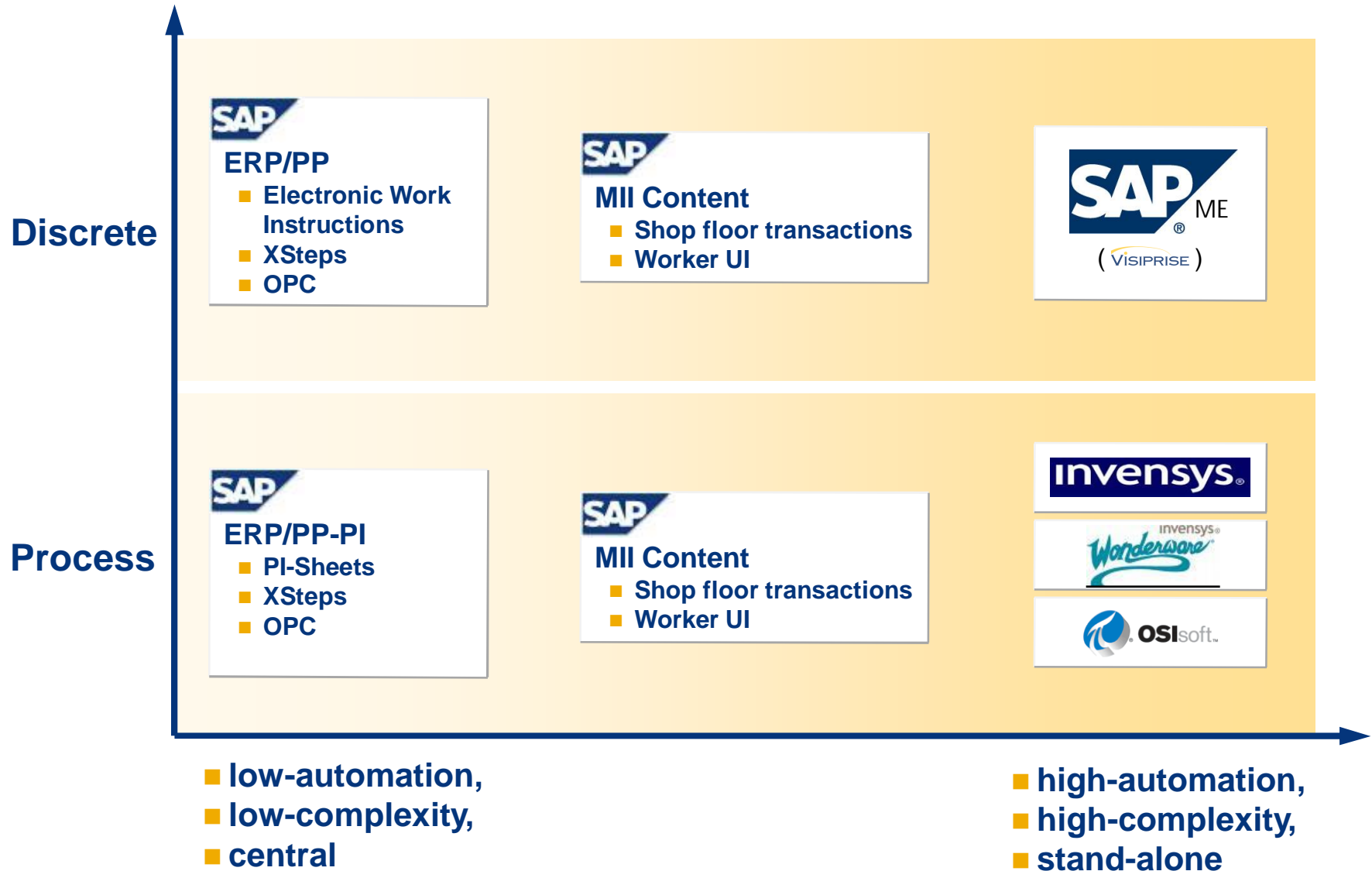
Materials Mgmt.

- Inventory Control
- Goods Movement
- Batch Information
- Material -Reservations
- Material -Characteristics
- Purchasing
- Tools

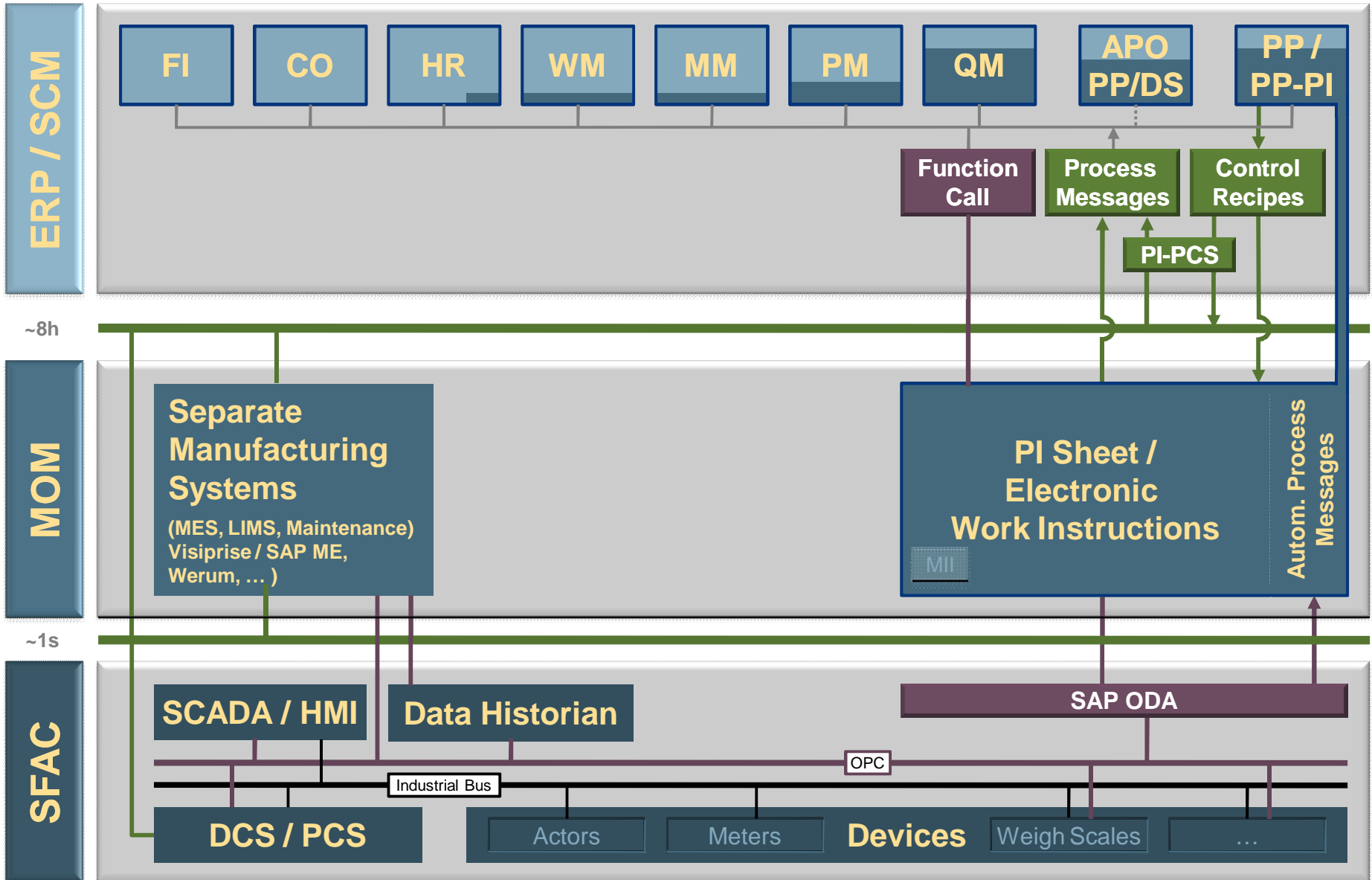
Quality Mgmt.

- Inspection Tasks
- Inspection Lots
- Sample Management
- Usage Decision
- Test Results -Recording



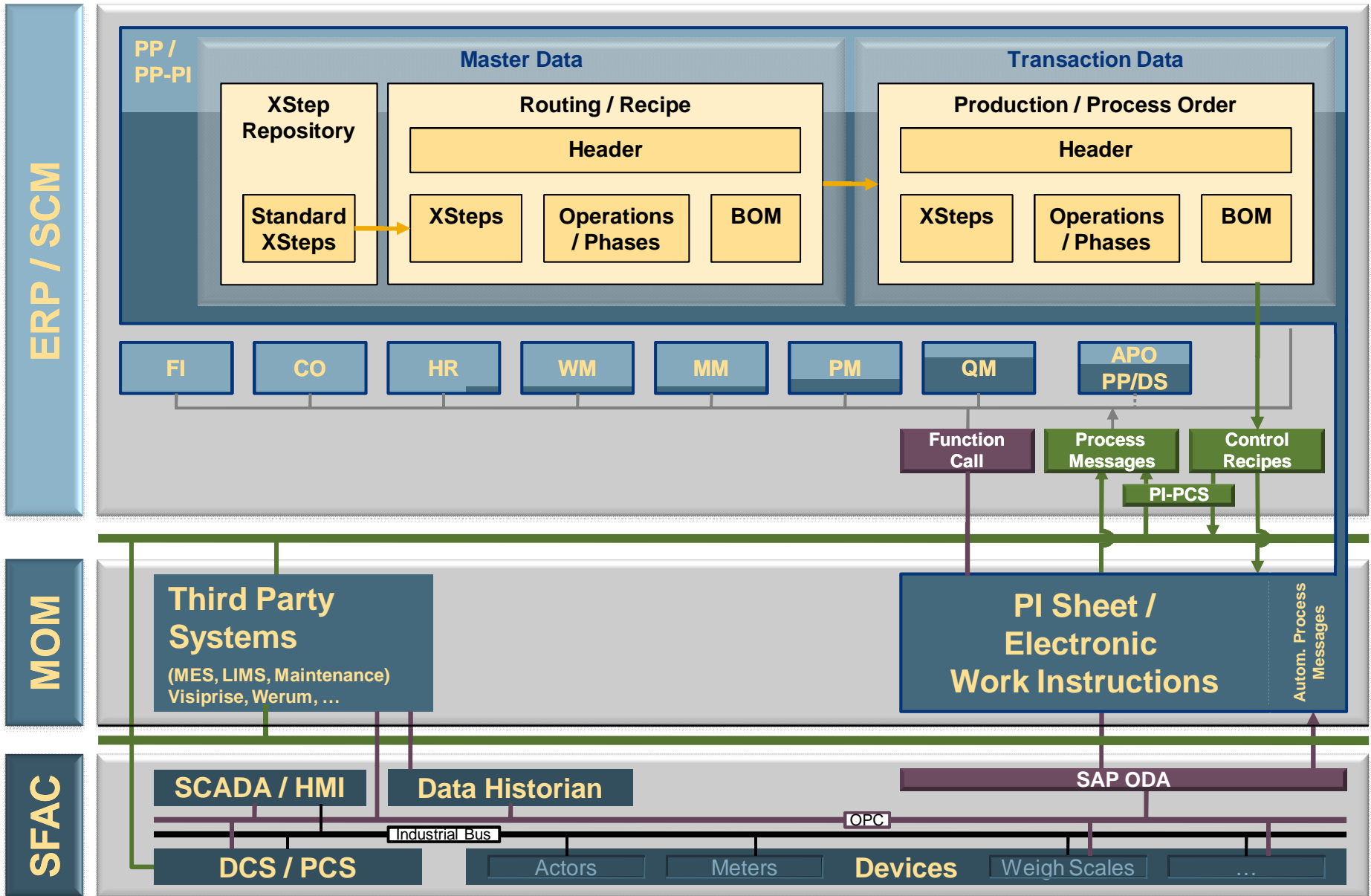


Manufacturing Levels and Landscape Using ERP Manufacturing only



Manufacturing Levels and Landscape

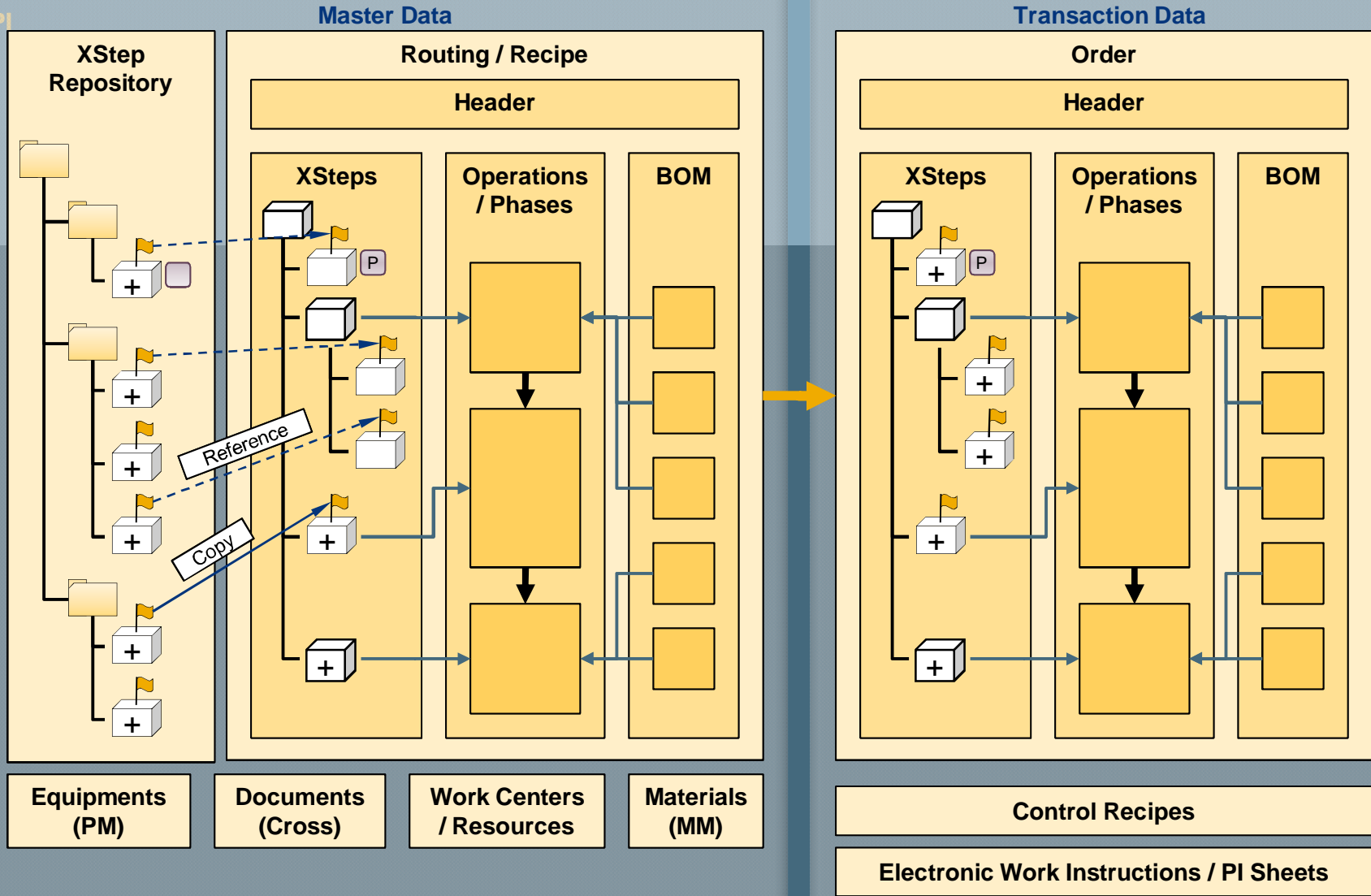
PP / PP-PI



PP / PP-PI: XSteps, Master and Transaction Data



PP /
PP-PI



Features of the PI Sheet / Electronic Work Instruction (I)

- Header with order information
- Containers for Operations / Phases (can be collapsed)
- Instruction containers for convenient structuring
- Long text elements are on the left side
- Short text and input elements are on the right side
- Tables stretch over the whole width
 - ▶ Repeated data input (extendable with new lines)
 - ▶ Grouped elements with similar structure (e.g. check lists, generated material lists, ...)
- Scrollable
- Input history can be logged
- Comments can be entered at any time

PI Sheet - Change
Process order: 000123456 Material Number 10001234 >>
Change -> Display Save Complete Print Create Comment

▼ Phase 0010

Goods receipt

Preparation:

- Enter production date
- Enter tare weight of pallet
- Enter average weight of pieces

Production Date

Tare weight of bins [kg]

Avg. piece weight [mg]

Weighing

- Put bin on the weigh scale
- Get bin weight
- Check result and confirm (OK?)

Sign the goods receipt

Weighing				
Get Bin Weight	Gross Wgt [kg]	Net Wgt [kg]	No. of pieces	OK?
Get Bin Weight	5.200	4.200	21000	Yes <input type="checkbox"/>
Get Bin Weight				<input type="checkbox"/>

Total of pieces

Signature

- Output of text instructions

Before weighing of the bins enter the average tare [kg]

Tare of bins [kg]

1,000

- In- and output of values

- ▶ Default values, value validation

- Tables

Tablet weighing

Bin weight [kg]	Tablet weight [mg]	Number of tablets
5,000	99,0	40.404
4,000	94,9	31.612

- Calculations

- Function calls

Display SOP

- OPC data access

- (e.g. read measurement from device)

- Digital signature (simple, multiple)

Arne MANTHEY

28.03.2008 09:32:47

Signature

- Automatic generation of order-related object

- (e.g. documents, components,...)

- Event-triggered execution of commands and functions

- ▶ Automatic execution of functions (e.g. immediate check of material status)
- ▶ Activation/deactivation of instructions based on conditions

- Process messages

- (Activity reporting, material consumption/production,...)

Liste der Dokumente

Dokument	Anzeige
Dokument 1	Anzeige
Document 2	Anzeige

XStep Life Cycle (I)

SXS Repository → Routing/Recipe → Order



SXS Repository

- Standard XSteps
 - Demo
 - 00 General Modules
 - 10 Order header
 - General Order Information
 - 20 Generated Material Lists
 - Material Consumption List
 - 30 Document Lists
 - 10 Production Area -A-
 - Machine Setup
 - 20 Production Area -B-
 - 90 Technical Modules
 - 99 Preparation / Test
 - 00 Manufacturing Summit

XStep Section of Production Order

Production Order 60012591 Change: XSteps

Object	Description
XStep Tree - Completely Generated	
Order 60012591	Plant 1000, control recipe destination C-1
Production	
Layout (XSL)	
Instructions on Start	
Order Information	General Order Information - Exploded
Components	Material Consumption List - Exploded
0001	
Work Instructions/PI Sheet	Plant , control recipe destination , address
Instruction	
Material component data	
For all Ingredients	
<New Process Instruction	
Material component data	Generated
Material component data	Generated
Material component data	Generated
0010	
Operation 0010	
Diameter Setup	
Instructions on End	

XStep Section of Routing

Routing 50002311 01

Object	Description
XStep Tree	
50002311 01	Product C
Production	Plant 1000, control recipe destination
Layout (XSL)	
Instructions on Start	
Order Information	General Order Information
Components	Material Consumption List
0010	
Operation 0010	Operation A
Diameter Setup	Machine Setup
Instructions on End	

Routing-specific parameter values

Name	Description	Value
P_LIML	Lower Limit	40,000
P_LIMU	Upper Limit	45,000
P_NUM	Number of table entries	3
P_TGT	Target value	42,000
P_TYPE	Value Type	Diameter
P_UOM	UoM	mm

Parameter values related to a specific component

Name	Symbol	Evaluation	Value
L_EVT_DAT			
L_EVT_TIM			
L_MT_CONS			
X_MT	Material	Automatically	XS_COMP_01
X_MT_QTY	Requirement Quantity	Automatically	10,000
X_MT_TXT	Description of Material	Automatically	text/plain
X_MT_UOM	Unit of Measure	Automatically	pc
X_ORDER	Order	Automatically	60012591
X_RES	Reservation	Automatically	0000110528
X_RES_NR	Reservation Item	Automatically	0004
X_SLOC	Storage Location	Automatically	0001

Generated elements (3 material components assigned to the order)

Automatic valuation of parameters

SXS with parameters

XStep Life Cycle (II): Order → EWI/PI Sheet → Process Message



XStep Section of Production Order 60012591

Production Order 60012591

Object

- Order 60012591
- Production
- Layout (XSL)
- Instructions on Start
 - Order Information
 - Components
 - 0001
 - Work Instructions/PI Sheet
 - Instruction
 - Material component data
 - For all Ingredients
 - New Process Instruction
 - Material component data
 - Material component data
 - Material component data
- 0010
 - Operation 0010
 - Diameter Setup
 - Instructions on End

Electronic Work Instruction (EWI)

Work Instructions - Change

Production Order: 000060012591 Material Number: XS_PROD_03 Batch: 0000001625 >>

Change -> Displ. Save Complete Print Create comment

Order Data

Please notice:

- Check the order dates (right side).
- Always wear glasses and gloves!

Start Date: 17.06.2008
Start Time: 10:28:20
End Date: 08.07.2008
End Time: 09:05:27

Material List

Please check the completeness of all components and enter the consumption quantities.

Material	Description	Planned Qty.	Qty.	UoM
XS_COMP_01	Component 1	10,000	11,0000	pc
XS_COMP_02	Component 2	40,000	43,0000	pc
XS_COMP_03	Component 3	20,000		pc

Operation 0010

Setup: Diameter

Please check 3 value(s) of Diameter:

- Target value: 42,000 mm
- Lower limit: 40,000 mm
- Upper limit: 45,000 mm

Table of measured values	
Measured value [mm]	
45,100	0
42,000	

PP_CONS Process Message

Characteristic	R..	T	V	Char. Value
PPPI_EVENT_DATE	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.06.2008
PPPI_EVENT_TIME	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	11:30:45
PPPI_MATERIAL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	XS_COMP_01
PPPI_MATERIAL_CONSUMED	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	11,0000
PPPI_UNIT_OF_MEASURE	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	pc
PPPI_STORAGE_LOCATION	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0001
PPPI_RESERVATION_ITEM	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0004
PPPI_RESERVATION	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0000110528
PPPI_PRODUCTION_ORDER	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	60012591

Material List in Production Order

Item	Component	Description	Reqmt Qty	Quantity Withdrawn	UoM
0010	XS_COMP_01	Component 1	10	11	PC
0020	XS_COMP_02	Component 2	40	0	PC
0030	XS_COMP_03	Component 3	20	0	PC

Parameter values (Diameter Setup)

Name	Description	Value
P_LIML	Lower Limit	40,000
P_LIMU	Upper Limit	45,000
P_NUM	Number of table entries	3
P_TGT	Target value	42,000
P_TYPE	Value Type	Diameter
P_UOM	UoM	mm

Line completed (points to Qty. 11,0000 in Material List)

Process message books material consumption (points to PPPI_MATERIAL_CONSUMED in Process Message)

Default value (points to 42,000 in Diameter Setup)

Deviation (points to 0 in Diameter Setup)

Release	Business Function	Solution Characteristic	Details
R/3 4.6c	-	HTML-based PI Sheet instructions (Big fonts, images,...)	<ul style="list-style-type: none"> ■ HTML formatting (Big fonts, images,...) ■ Flexible usage of custom function modules ■ New generic process instruction (Type 0)
		Electronic Batch Record (EBR)	
R/3 4.7	-	Adaptiveness by usage of commands and events	
		Easy OPC integration	<ul style="list-style-type: none"> ■ SAP ODA
R/3 4.7 Ext. 2.0	-	XSteps – Easy to reuse building blocks	
ERP 2005 EhP2	LOG_PP_PI_EHM	Process Industry Enhancements: XSteps (regulated environment)	
EhP3	LOG_PP_XS_RTG_PO	XSteps for Routing and PO (Discrete)	
	LOG_PP_PMA_PMC	Misc. PI Sheet enhancements	<ul style="list-style-type: none"> ■ General styleheet enhancements ■ Discarding PI Sheets from process order ■ Mandatory entries by setting in characteristic ■ Improved PARAMETER_CHANGED event ■ New PDF printing function
		Standard XStep Library	<ul style="list-style-type: none"> ■ Collection of Standard XSteps: SDN (→ Downloads → Core Manufacturing)
EhP5 (planned)	LOG_PP_PI_PMA_01	Archiving of PI Sheets and EWI	
	LOG_PP_XS_01	XStep enhancements for globalization	<ul style="list-style-type: none"> ■ Cross-plant repository ■ Language dependency

PI Sheets / Electronic Work Instructions:

- ,One-stop shop‘ for the worker to access and provide all ERP-related information. No need to run multiple transactions.
- Flexibility and speed by dynamic and event-triggered instructions
- Control of the material and information flow between ERP and production systems (OPC)

XSteps:

- XSteps are easy to create and maintain. Much of the day-to-day work can be done by functional departments. The IT department can concentrate on more complex areas.
- The repeated use of standard building blocks (SXS) reduces the maintenance effort for the master data definition

Information and XStep examples are available on:

- [BPX Community for Manufacturing](#)
- [XStep Café](#)

Date	Title	Description	Ready	Rating
9 Jun 2010	XStep Café - Session 02	Commands on process steps. If help with material number profiled, Resonk, custom symbols/generation.	0	10
18 May 2010	Archiving of PI Sheets and Electronic Work Instructions (EWI) (Past Note)	The only way to archive PI Sheets and delete the corresponding database tables is to use the EBR functionality. For all other cases (Test PI Sheets, or PP-based Electronic Work Instructions) archiving is not possible. However, deletion of old entries from the database becomes essential for maintaining the performance of the ERP system. In this article I describe a pilot note which solves this dilemma.	4	62
6 May 2010	Quick Tip: Complete Material List	If you have assigned components to different phases or operations you may want to get an overview of all components regardless of their phase assignment at the start of the PI Sheet or Electronic Work Instruction. Here is the way how to do it.	0	86
5 May 2010	XStep Café - Session 21	Chatting about Weighing/OPC, beginners tips, etc.	1	53
26 Apr 2010	The Ultimate Guide to Type 6 Process Instructions	In this article I give you a guide on the correct sequence you need to follow when using process instructions of type 6 (no XSteps).	0	87
22 Apr 2010	Restriction on Table Row numbers and Performance	There was a question by Maddy in the Topic Discussion section about the maximum number of table lines (more than 999) which is equal like to answer here.	1	71
9 Apr 2010	Quick Tip: Hide the Option for Adding New Lines in Tables	There might be situations where you want to handle the adding of lines in a repeated data request (table) entirely with commands or with function modules and tabular parameters. In such a case you usually want to avoid that users can manually create new lines by...	1	87

Thank you!

MDA & OPC

PI-PCS Interface

- Message based
- Targets fully automated processes without user interaction
- Asynchronous
- Subscription
- Vendors have to implement interface;
Certification of solutions

SAP OPC Data Access

- Manual or semiautomated processes with user interaction (e.g. PI-sheet)
- Synchronous
- Industry standard is used; no certification necessary
- Generic (any OPC DA Server)

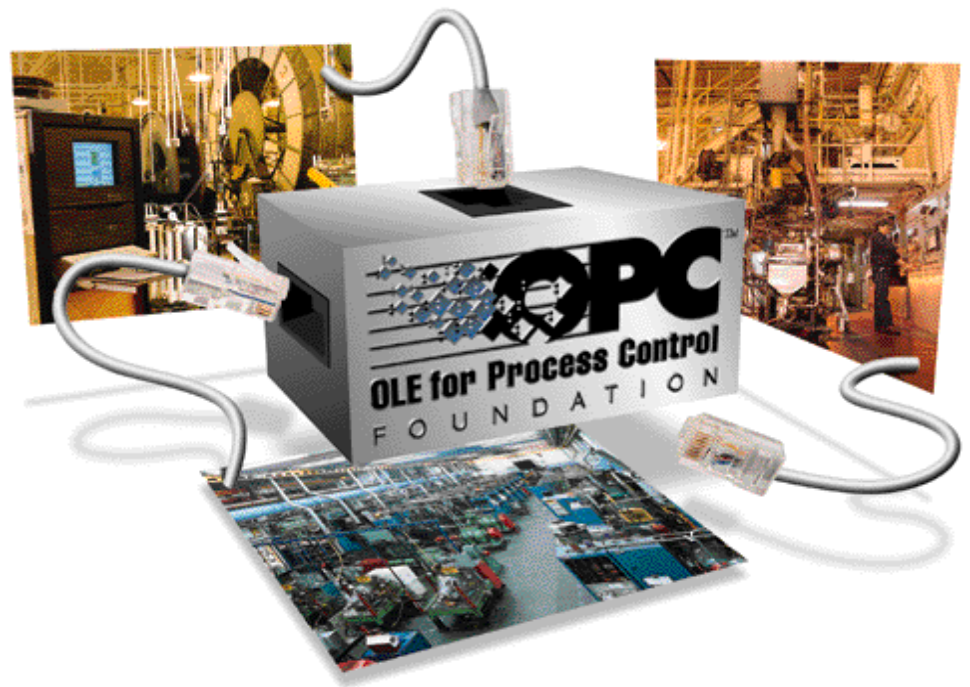
Both interfaces complement each other !

”OPC is open connectivity via open standards”

Source: [OPC Foundation](http://www.opcfoundation.org)

- Non-proprietary Industry-Standard
- Non-profit Organization
- Nearly 400 Members

www.opcfoundation.org



- ✓ OPC Data Access (OPC DA)
- ✓ OPC Events & Alarms (OPC EA)

OPC for Batch

OPC DX

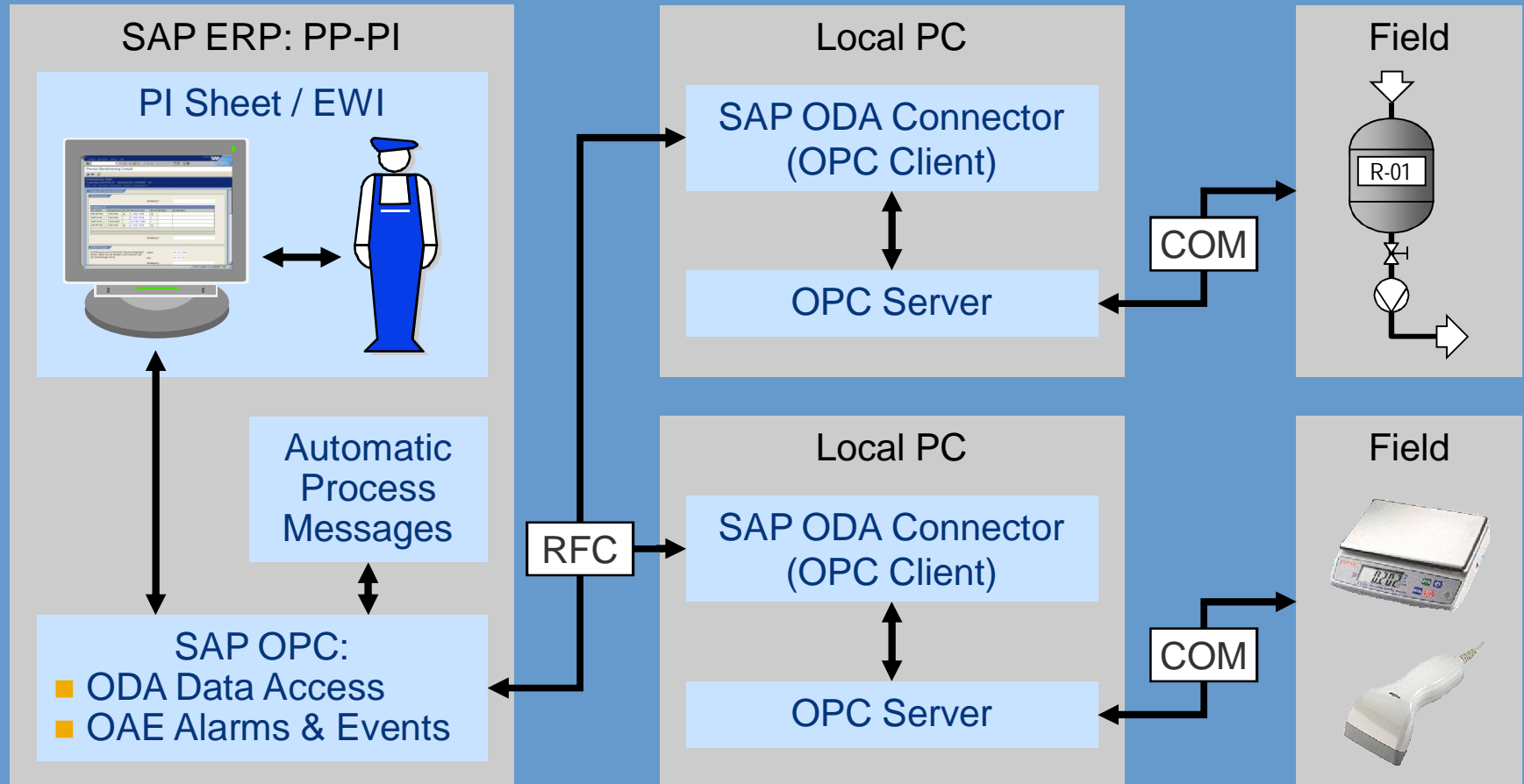
OPC Data Historian

OPC XML

Security



Manufacturing Operations



Download the SAP ODA Connector:

<http://service.sap.com/manufacturing> → Downloads → SAP OPC Data Access

EhP2: Enh. for Regulated Industries

Standard XSteps as Building Blocks for PI Sheets require additional features (regulated environment):

Main features:

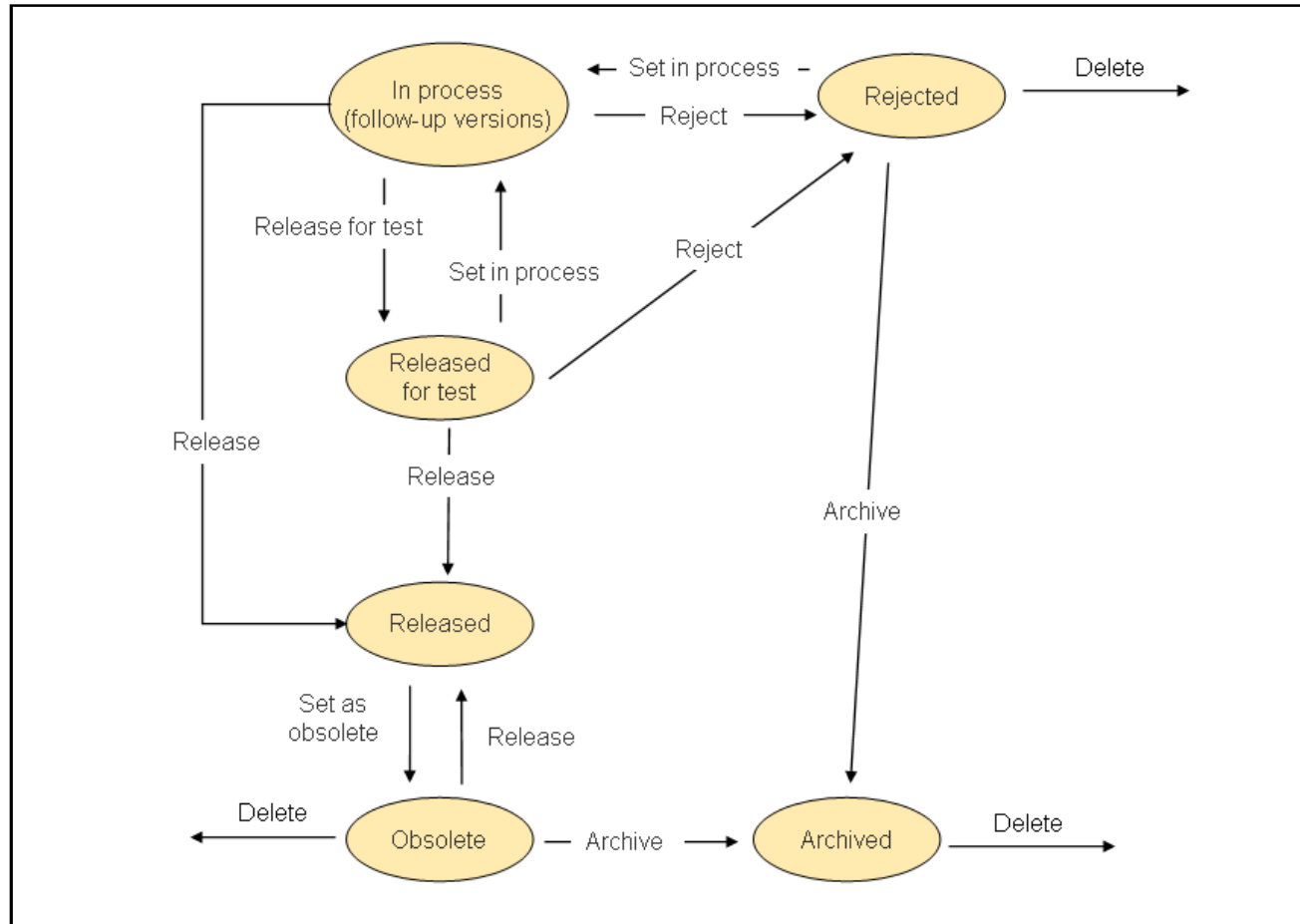
- Approval procedure for SXS versions using digital signatures
- Where-used list for SXS
- XML export and import of folders, SXS and SXS versions

„Nice to have“:

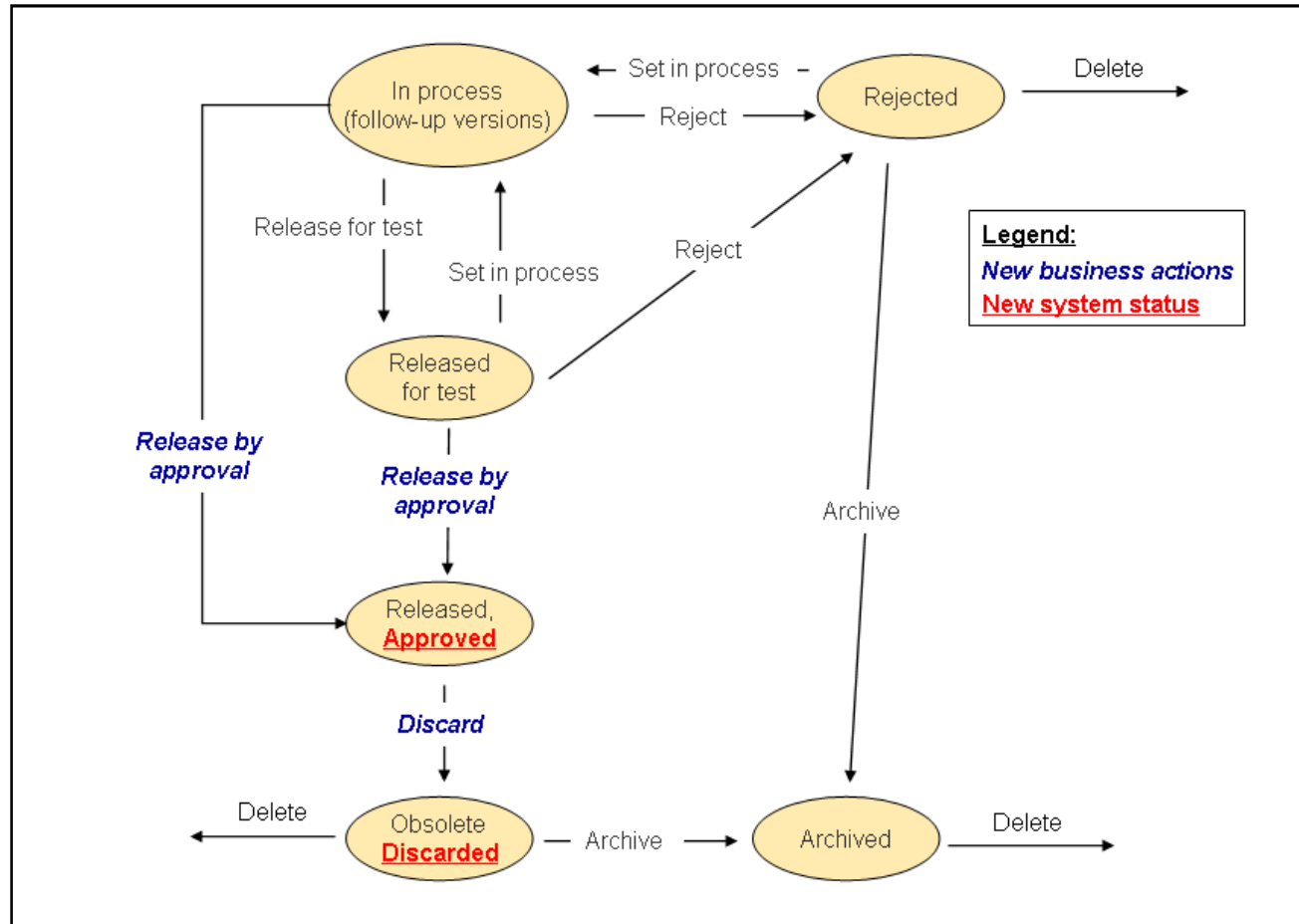
- Checksum test during XML import
- Automatic numbering of SXS version
- Automatic calculation of the valid to-date for released SXS version

Setup: Customizing [CMX21]

Standard scheme for an SXS version



Standard scheme for an SXS version with approval (pharma)



Repository for Standard XSteps with Versions, Plant 0001

Change Display

Object	Description
Standard XSteps	Repository for Standard XSteps with Versions
00 Adaptive Manufacturing Summit 2007	Demo folder U. Dittes - do not use!
AMS SXS for Safety Instructions	
0001	Version 0001: Released Approved; Validity Period: 06.09.2007 -
AMS SXS for Signature (Safety Instruct.)	
AMS: SXS composite Safety Instr./Signat.	Contains Safety Instruction and Signature

Use Standard XStep AMS SXS for Safety Instructions

Application	Explosion Level	Deletion Flag	Status Reference	Routing Type	Task List Group	Group Counter	Change Number	Manufacturing Ord...
	1							000001000443
	1							000001000444
	1							
	2			2	AMS_DEMO	01	AMS_0609	
	2			2	AMS_DEMO	01	AMS0112	
	2							000001000443
	2							000001000444

EhP3:

Misc. Enhancements

Detail Functions

- General styleheet enhancements
- Discarding PI Sheets from process order
- Mandatory entries by setting in characteristic
- Improved PARAMETER_CHANGED event
- New PDF printing function

Customizing:

For all functions except discarding PI Sheets from process order

SPRO → PP-PI → Process Management → Control Recipes → Activate Enhancements for PI Sheet

Phase0030

Work Instructions

Date	Time	Material quantity 1	Mengeneinheit
06.09.2007	22:09:11	20,000	kg

Material quantity 1
20,000

Phase0040

Work Instructions

Change Characteristic

Characteristic: Z_PH_VALUE
Change Number:
Valid From: 06.09.2007

Basic data | Descriptions | Values | Restrictions

Basic data

Description:
Chars Group: Process Message Characteristics
Status: Released
Auth.Group:

Format

Data Type: Numeric Format
Number of Chars: 1
Decimal Places:
Unit of Measure:
Template: -
Exp. display: No exponent

Value assignment

Single-value
 Multiple Values

Interval vals allowed
 Negative Vals Allowed
 Restrictable
 Entry Required

Mandatory! PH Value measured:*

Show comment icon in table cells



Set fields mandatory with the help of characteristics (flag 'Entry Required' set)




The screenshot displays a SAP interface with a menu bar at the top: "Chnge -> Displ. Save Complete Print Create comment Expand Collapse". Below the menu, there are several phase entries: Phase0020, Phase0030, Phase0040, Phase0050, and Phase0060. Each phase has a "Work Instructions" section. Phase0040 includes a text field "Added amount of water (X>10) : 3,000" and "Mandatory! PH Value measured: 2". Phase0050 includes an "Instruction for the plant personnel:" section with a "Note" and a signature field "Signature for 2 Signers:" with the name "Uwe Dittes".




Three red boxes highlight icon sets on the right side of the interface:

- Top box: Contains icons for signatures (green checkmark and pencil), comments (pencil), and a green LED.
- Middle box: Contains icons for deviations (yellow lightning bolt), a warning sign (yellow triangle), and a lock (grey padlock).
- Bottom box: Contains icons for signatures (green checkmark and pencil), a lock (grey padlock), a green LED, a yellow LED, and a grey LED.

Yellow arrows point from the legend boxes below to the corresponding icon sets in the screenshot.

 Icon Deactivated: Phase contains deactivated elements
 Icon Locked: Phase contains locked elements

 Icon for Signatures already done: There are signatures present
 Icon for Deviations: Deviations occurred in the phase
 Icon for Comments: Comments were created for the phase

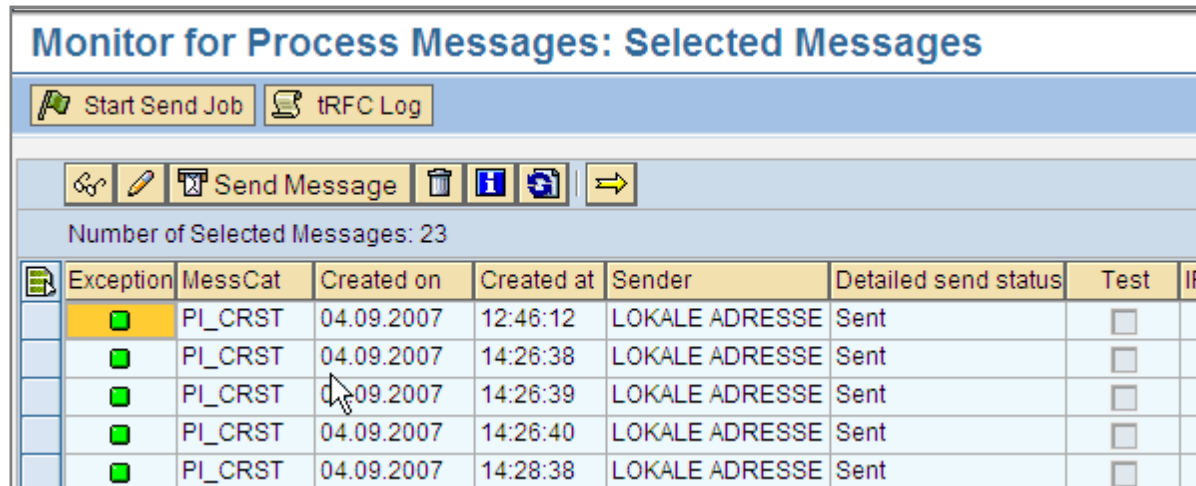
 LED Green: Signature completed
 LED Yellow: Signature in progress with more than one signer
 LED Grey: Signature present, not started yet
No LED: No Signature present

New transactions for

- Control Recipe Monitor (CO53XT)
- Process Message Monitor (CO54XT)
- Work List for PI Sheets/Work Instructions (CO60 & CO60XT)

Using configurable ALV_GRID_XT:

- Adding additional columns modification-free (via BAdI implementation and customer-defined append structure)



The screenshot shows the SAP transaction 'Monitor for Process Messages: Selected Messages'. It features a toolbar with buttons for 'Start Send Job' and 'tRFC Log'. Below the toolbar is a row of icons for 'Send Message', a trash can, a document, a refresh icon, and a right-pointing arrow. A status bar indicates 'Number of Selected Messages: 23'. The main area contains a table with the following columns: Exception, MessCat, Created on, Created at, Sender, Detailed send status, Test, and IP. The table displays five rows of data, all with a green status icon and 'Sent' status.

Exception	MessCat	Created on	Created at	Sender	Detailed send status	Test	IP
■	PI_CRST	04.09.2007	12:46:12	LOKALE ADRESSE	Sent	<input type="checkbox"/>	
■	PI_CRST	04.09.2007	14:26:38	LOKALE ADRESSE	Sent	<input type="checkbox"/>	
■	PI_CRST	04.09.2007	14:26:39	LOKALE ADRESSE	Sent	<input type="checkbox"/>	
■	PI_CRST	04.09.2007	14:26:40	LOKALE ADRESSE	Sent	<input type="checkbox"/>	
■	PI_CRST	04.09.2007	14:28:38	LOKALE ADRESSE	Sent	<input type="checkbox"/>	

Process Manufacturing Cockpit MANTHEY SAP

Process Manufacturing Cockpit MANTHEY

Drucken (PDF)

Herstellanweisung - Test-Ändern
 Prozeßauftrag:000070003802 Materialnummer:N-2100 >>
 Änd. -> Anz. Speichern Abschließen Drucken Kommentar anl. Expandieren Komprimieren

Phase0011:- Weighing material

Instruction

Start Phase Output Dummy
 Value

Output	Value	Sign here
Dummy		

Arne Manthey
 Sign here

Mat	Description	Batch	SLoc	Qty	Act. Qty.	UoM
N-2120	Maisstärke		0002	0,748		kg
N-2130	Cellulosepulver		0002	0,748		kg
N-2140	Aspartam		0002	4,000		Gramm
N-2110	Acetylsalicylsäure		0002	500,000		Gramm

Sign here

Phase0021:- Mixing

CO60 usal2q3f INS

Adobe Reader - [PDF-Print.pdf]

File Edit View Document Tools Window Help

100000000000004834 Page 1 of 3

Herstellanweisung - Test

Steuerzept 100000000000004834
 Prozeßauftrag 000070003802
 Kurztext zum Prozeßauftrag Cetepharm-N (tablets)
 Materialnummer N-2100
 Kurztext zum Material Cetepharm-N Tablette

Phase0000

Arbeitsanweisung

Phase0011 :- Weighing material

Arbeitsanweisung

HTML Fragment

Start Phase Output Dummy
 Value

Table	Output	Value	Sign here
Dummy			

Arne Manthey
 01.10.2007 17:13:05
 Sign here

Component list

Mat	N-2120
Description	Maisstärke
Batch	
SLoc	0002
Qty	0,748
Act. Qty.	
UoM	kg

Component list

Mat	N-2130
Description	Cellulosepulver
Batch	

1 of 3

EhP3: SXS Library

Purpose

- Collection of best-practice building blocks
- Speed-up of implementation

Required Functionality

- Usage of XStep-based PI Sheets (PP-PI)
- Importing of XStep folders
- Usage of XSteps for production orders (work instruction sheets)



Release

















**Since R/3 4.70
Ext. 2.0**

Since ERP 2004

ERP 2005 EhP 3

Repository for Standard XSteps with Versions, Plant 3100

 Change  Display

Object	Description
▼  Standard XSteps	Repository for Standard XSteps with Versions
▼  SXS-Library	
▼  SXS library COMPLETE	Contains BASIC and ADVANCED SXS Building blocks
▶  00 General Remarks Concerning Simulation	Limitations for the simulation of PI Sheets
▶  SXS: Calculations (manual/automatic)	Executes calculations manually/automatically
▶  SXS: Changing the 'Look and Feel'	Usage of different style sheets or CSS modification
▶  SXS: Checklists (Customer)	Z characteristics required!
▶  SXS: Checklists (SAP stand.)	Examples for checklists
▶  SXS: Defining Tables	Grouped instructions, parameterized tables etc.
▶  SXS: Dynamic Function Calls (Customer)	Usage of Z-function modules necessary!
▶  SXS: Dynamic Function Calls (SAP stand.)	Usage of function modules of the SAP standard
▶  SXS: Execution of Commands via Triggers	Triggers: Formula, functions or events
▶  SXS: Input and Output of Data	Set and get values of different formats
▶  SXS: Output of Actual Date/Time	Output of actual date and time
▶  SXS: SAP Process Messages	Building blocks for SAP process messages
▶  SXS: Using MDA Data Points	Working with Manufacturing Data Access (MDA)

Structure of the SXS Library

The screenshot shows the SAP SXS Library interface. The left pane displays a tree view of the library structure under 'Standard XSteps' and 'SXS-Library'. The right pane shows a 'PI Sheet - Simulation' for 'Phase0000'. The simulation content includes a 'Read this first (SXS docu!)' instruction, a 'Remarks' section with a list of instructions, and an 'Example' section with a table for 'Input of Machine Parameters'.

Parameter:	Value:
Type of Machine	
Max. Temperature °C	

Folders for different categories of SXS

Every SXS has a separate documentary instruction (To be deleted for later use)

Sample instructions demonstrate the usage

SXS

Simulation: Displays a preview of the SXS on the right side

Example: Checklist

Examples for checklists
Checklist using SXS reference node for table line
Single line for checklist
Built from SXS reference 'Check Table Line Element'
Version 0001: In Process
XStep Tree
Plant, control recipe destination, address
SXS: Check Table Line Element
SXS: Check Table Line Element
SXS: Check Table Line Element

Show the usage of SXS references inside the SXS repository

Description	Category	T	Symbol	Evaluation	Value
Color of Text	Input	<input type="checkbox"/>		Fixed Value	green
Text	Input	<input type="checkbox"/>		None	text/plain
Title	Input	<input type="checkbox"/>		Reference	LV_TITLE
Type of check item	Input	<input type="checkbox"/>	Description of the XStep	Automatically	

Show how parameters can be used to control the behaviour of an SXS reference (e.g. color)

PI Sheet - Simulation

>>

Print

Phase0000

Phase

Work Instruction

List	Status OK?
Motor checked	Yes <input type="checkbox"/>
Tank checked	Yes <input type="checkbox"/>
Weigh scale checked	Yes <input type="checkbox"/>
	Yes <input type="checkbox"/>
	No <input type="checkbox"/>

Example: Material List

Process order: 70004082 **Process Order: Bill of Material**

Material: N-2100 Cetepharm-N tablet Plant: 1100

Item	Material	Material description	Requirement quantity	U...	Stor...	Batch
0001	N-2110	Acetysalicylic acid - Grade 0123456789	500	G	0002	
0010	N-2120	Cornstarch	0,748	KG	0002	
0020	N-2130	Cellulose powder	0,748	KG	0002	
0030	N-2140	Aspartam	4	G	0002	
0040						

SXS reference in process order

Process Order: XSteps

Process Order 70004082 Change: XSteps

PI Sheet - Simulation
Process Order:000070004082 Material Number:N-2100 >>

Material	Material Text (40 Characters!)	Quantity	UoM
N-2110	Acetysalicylic acid - Grade 0123456789	500,000	G
N-2120	Cornstarch	0,748	KG
N-2130	Cellulose powder	0,748	KG
N-2140	Aspartam	4,000	G

Simulated XSteps in process order (including generation)

SXS Repository

40 character material short text

Generation Scope

HTML code valuation

```
<DIV style="font-size: 16pt">&LVA_MT&</DIV>
```

Example: CSS Adoption

Repository for Standard XSteps with Versions, Plant 3100

Change Display

Object Description

- Standard XSteps
 - SXS-Library
 - SXS library COMPLETE
 - 00 General Remarks Concerning Simulation
 - SXS: Calculations (manual/automatic)
 - SXS: Changing the 'Look and Feel'
 - SXS: Change layout via CSS manipulation
 - 0001
 - SXS: Change layout via CSS manipulation** (highlighted)
 - PI Sheet
 - PI: SXS Documentation
 - Instruction w/ hidden CSS style
 - <Grouping>
 - General Information
 - SXS: Different PI Sheet Layout (XSL)
 - SXS: Checklists (Customer)

PI Sheet - Simulation

General Information

The background colours are defined by evaluation of the corresponding parameters with fixed values (standard colors like RED, BLUE or hexadecimal values for colors)

MANTHEY usai1q1e INS

SXS: Change layout via CSS manipulation

General Parameters Valuation Destination Context

Parameter Name	Evaluation	Value
LV_BGCOL	Fixed Value	RED
LV_BGPHCOL	Fixed Value	BLUE

Change the background color of the PI Sheet

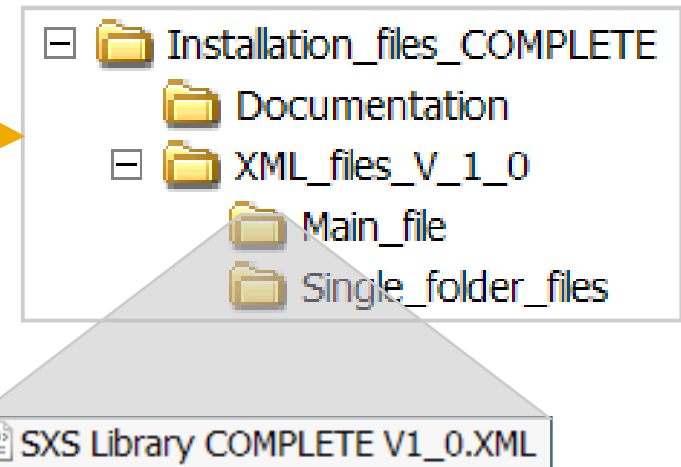
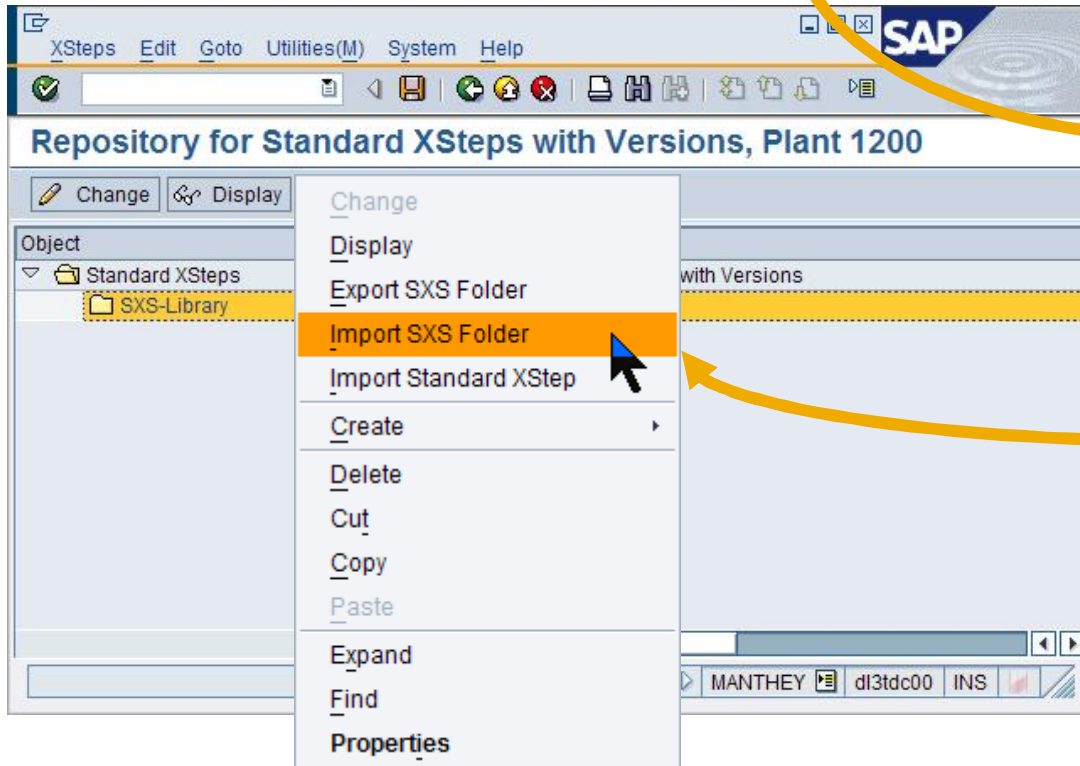
Change the background color of the phase container

How to get the SXS Library from SDN/BPX

<https://www.sdn.sap.com/irj/sdn/bpx-manufacturing>

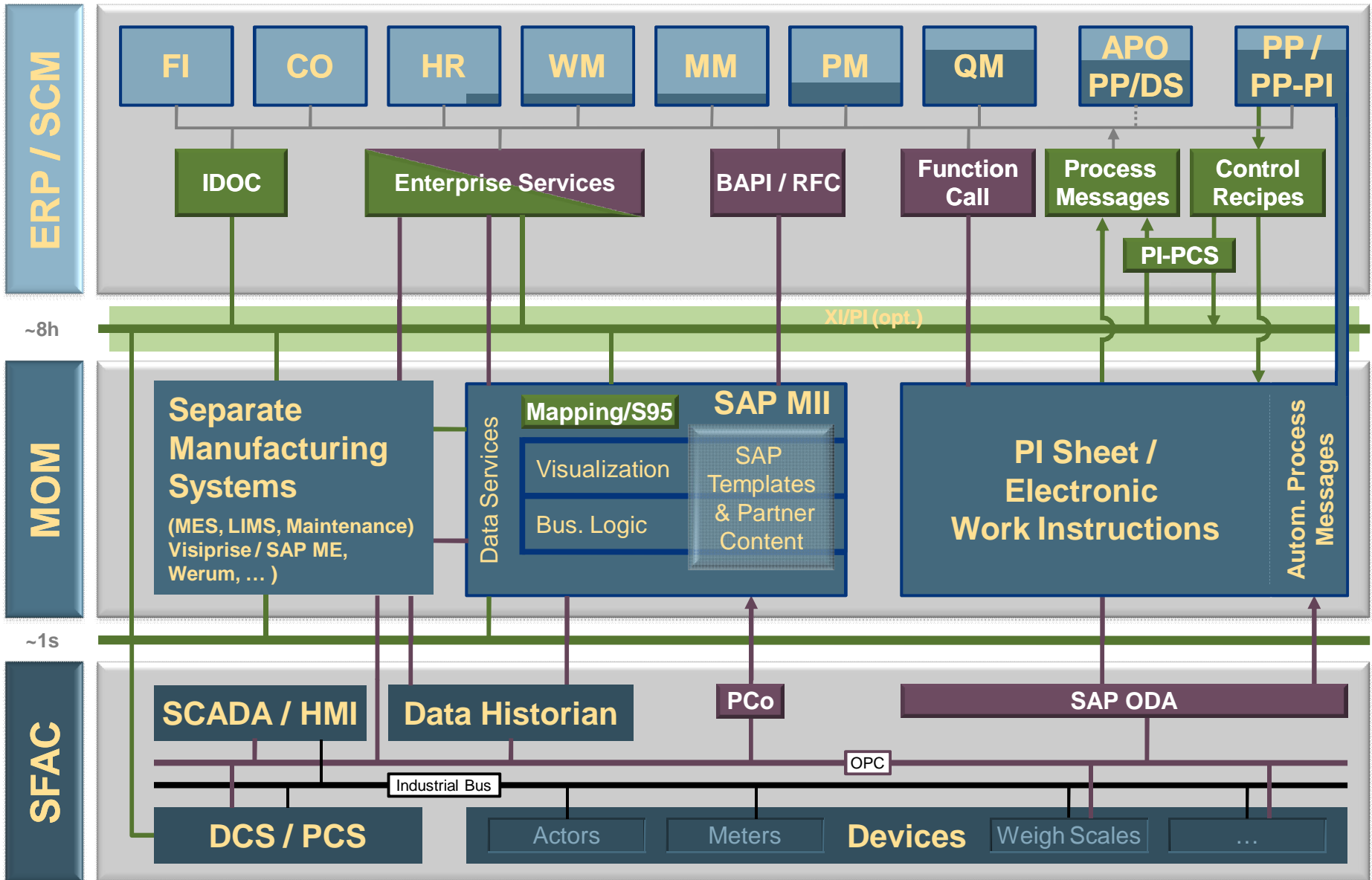
→ Downloads → Core Manufacturing

Name of Download Item (ZIP file)	Description
Flexible Building Blocks for Shop Floor Instruction Sheets - Basic Standard XStep Templates	Library of SXS which do not use any custom characteristics or function modules
Flexible Building Blocks for Shop Floor Instruction Sheets - Advanced Standard XStep Templates	Library of SXS which use custom characteristics or function modules. (To be created before importing the library)
Flexible Building Blocks for Shop Floor Instruction Sheets - Standard XStep Library	Both basic and advanced libraries



Appendix

Manufacturing Levels and Landscape

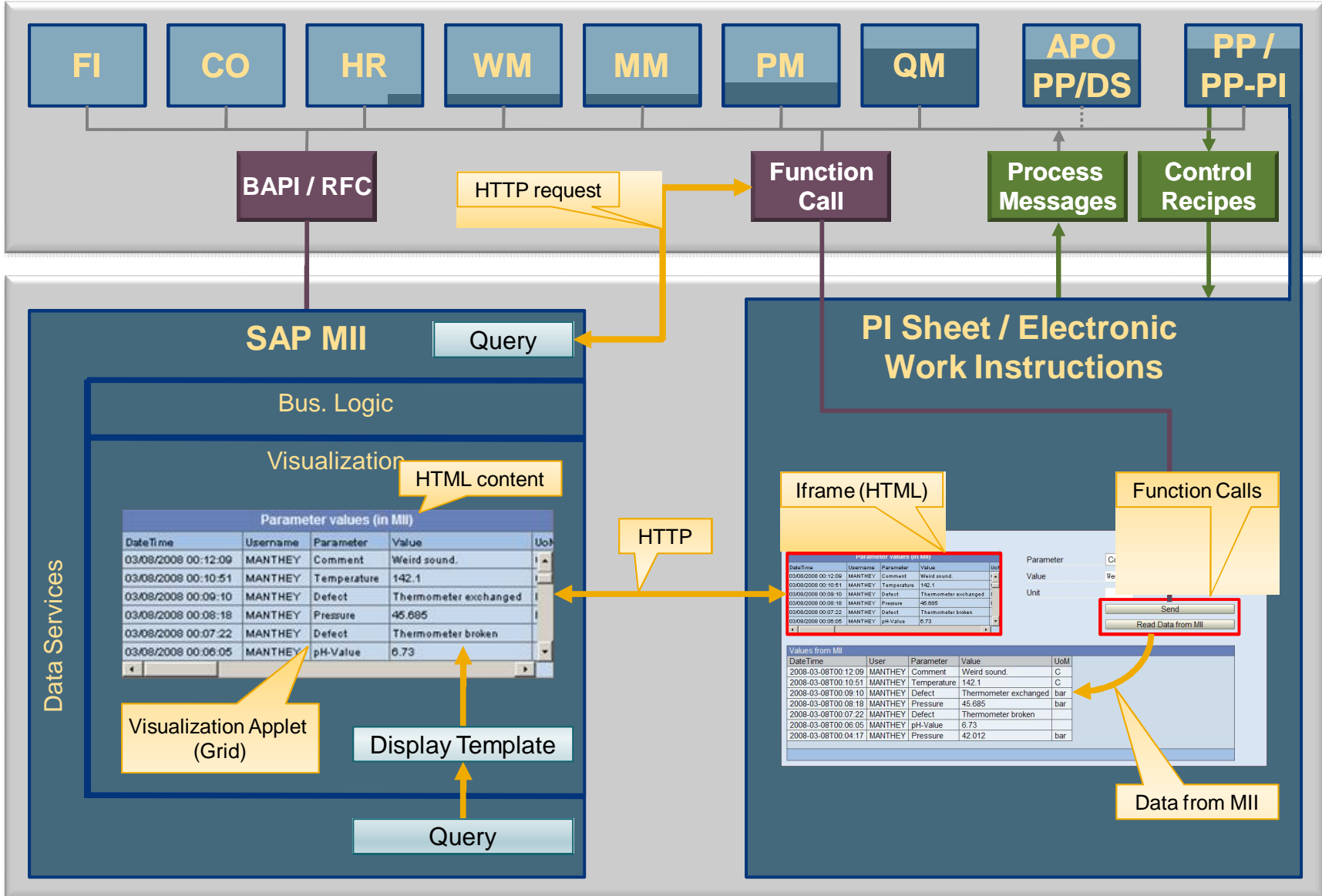


Connecting MII and PI Sheet / Electronic Work Instructions



ERP / SCM

MOM



Parameter values (in MII)

DateTime	Username	Parameter	Value	UoM
03/08/2008 00:12:09	MANTHEY	Comment	Weird sound.	
03/08/2008 00:10:51	MANTHEY	Temperature	142.1	
03/08/2008 00:09:10	MANTHEY	Defect	Thermometer exchanged	
03/08/2008 00:08:18	MANTHEY	Pressure	45.685	
03/08/2008 00:07:22	MANTHEY	Defect	Thermometer broken	
03/08/2008 00:06:05	MANTHEY	pH-Value	6.73	

Parameter values (in MII)

DateTime	Username	Parameter	Value	UoM
2008-03-08T00:12:09	MANTHEY	Comment	Weird sound.	C
2008-03-08T00:10:51	MANTHEY	Temperature	142.1	C
2008-03-08T00:09:10	MANTHEY	Defect	Thermometer exchanged	bar
2008-03-08T00:08:18	MANTHEY	Pressure	45.685	bar
2008-03-08T00:07:22	MANTHEY	Defect	Thermometer broken	bar
2008-03-08T00:06:05	MANTHEY	pH-Value	6.73	bar

Values from MII

DateTime	User	Parameter	Value	UoM
2008-03-08T00:12:09	MANTHEY	Comment	Weird sound.	C
2008-03-08T00:10:51	MANTHEY	Temperature	142.1	C
2008-03-08T00:09:10	MANTHEY	Defect	Thermometer exchanged	bar
2008-03-08T00:08:18	MANTHEY	Pressure	45.685	bar
2008-03-08T00:07:22	MANTHEY	Defect	Thermometer broken	bar
2008-03-08T00:06:05	MANTHEY	pH-Value	6.73	bar
2008-03-08T00:04:17	MANTHEY	Pressure	42.012	bar

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